Utilizing the Multi-Radar Multi-Sensor Rotation Track product as a verification data set for convection allowing models

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The Multi-Radar Multi-Sensor (MRMS) system is a state-of-the-science data ingest and analysis system that processes WSR-88D data every 2 minutes on a 1 km horizontal grid with 33 vertical levels. Over the last three years a special research MRMS domain was run in conjunction with the National Severe Storms Laboratory Warn-on-Forecast System (WoFS) to serve as a verification dataset for WoFS updraft helicity and simulated reflectivity guidance.

This presentation will discuss the challenges and methodology of using azimuthal shear from a real-time system as a verification data set of rotation guidance from WoFS and other Convective Allowing Models (CAMS). MRMS azimuthal shear aggregated over fixed intervals can be used to identify the rotation tracks of mesocyclones and serve as a proxy measurement of severe thunderstorms. However, spurious rotation tracks associated with gust fronts and other convergent boundaries require extensive quality control to be applied to the raw azimuthal wind shear fields. These quality control methods include multiple hypothesis testing and the enhanced watershed algorithm, which help ensure azimuthal shear-based rotation tracks are associated with mesocyclones. The resulting MRMS rotation track dataset provides a means of mitigating limitations of local storm report datasets for verifying CAM updraft helicity forecasts.

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